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09/886,083	06/21/2001	Yuichi Takamine	36856.513	5890

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Keating & Bennett LLP  
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EXAMINER

SUMMONS, BARBARA

ART UNIT	PAPER NUMBER
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2817

DATE MAILED: 05/22/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/886,083

Applicant(s)

Takamine et al.

Examiner

Baila Summora

Group Art Unit

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— The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address —

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 (three) MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- ☒ Responsive to communication(s) filed on 2/18/03
- ☒ This action is **FINAL**.
- ☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 1 1; 453 O.G. 213.

## Disposition of Claims

- ☒ Claim(s) 1-22 is/are pending in the application.
- ☐ Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- ☒ Claim(s) 1-4, 7-9, 11-13, 16, 21 and 22 is/are rejected.
- ☒ Claim(s) 5, 6, 10, 14, 15 and 17-20 is/are objected to.
- ☐ Claim(s) \_\_\_\_\_ are subject to restriction or election requirement

## Application Papers

- ☒ The proposed drawing correction, filed on 2/18/03 is ☒ approved ☐ disapproved.
- ☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner
- ☐ The specification is objected to by the Examiner.
- ☐ The oath or declaration is objected to by the Examiner.

## Pri nity under 35 U.S.C. § 119 (a)-(d)

- ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119 (a)-(d).
- ☐ All ☐ Some\* ☐ None of the:
  - ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_
  - ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a))

\*Certified copies not received: \_\_\_\_\_

## Attachment(s)

- ☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). 4
- ☒ Notice of R ference(s) Cited, PTO-892
- ☐ Notice of Draftsperson's Patent Drawing Review, PTO-948
- ☐ Interview Summary, PTO-413
- ☐ Notic of Informal Patent Application, PTO-152
- ☐ Other \_\_\_\_\_

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## DETAILED ACTION

### *Drawings*

1. The proposed drawing correction and/or the proposed substitute sheets of drawings, filed on 2/18/03 have been approved. A proper drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The correction to the drawings will not be held in abeyance.

### *New Grounds of Claim Rejections - 35 USC § 112*

2. The following is a quotation of the second paragraph of 35 U.S.C. § 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 21 is rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 9 was amended to include the second IDT of the second-stage filter having opposed bus bars with "a first balanced signal terminal connected to one of said two opposed bus bars" and "a second balanced signal terminal connected to the other of said two opposed bus bars" (see claim 9, lines 8-12, 15-16, and 18-19). Therefore, claim 21 is unclear as to how the second IDT of the second stage filter can be "split into two parts" when split IDTs have their balanced terminals on the same side bus bars (see 314 and 315 in Applicants' Fig. 16) not "opposed bus bars" as required by claim 9. In other words, claim 21 appears to directly contradict claim 9. Additionally, Applicants argue the same point that the balanced terminals from the split electrode

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of Saw et al. are from left and right ends of the same bus bar (see the last paragraph on page 8 of the Faxed amendment received 2/18/03).

*Withdrawn Claim Rejections - 35 USC §§ 102 and 103*

4. Applicants' amendment and arguments received 2/18/03 have overcome all previous prior art rejections of the claims.

*New Grounds of Claim Rejections - 35 USC § 102*

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in-

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or

(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

6. Claims 1-3 and 8 are rejected under 35 U.S.C. § 102(b) as being anticipated by Ueda et al. U.S. 5,963,114.

Figs. 9 and 20 of Ueda et al. '114 disclose a longitudinally coupled resonator type surface acoustic wave (SAW) filter having a balance-unbalance conversion function, the filter comprising a piezoelectric substrate of LiTaO<sub>3</sub> (see e.g. col. 7, lns. 47-49 and col. 8, lns. 64-65). Fig. 20

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shows a differential mode modification of the filter in Fig. 9 (see col. 14, lns. 65-67), wherein the lower filter 21 in Fig. 20 has an unbalanced input from node  $Z_2$  and balanced output terminals from the second center interdigital transducer (IDT); wherein the second center IDT has a whole number of electrode finger pairs  $N_2 = 21$  (see col. 9, lns. 53-56 and col. 7, lns. 2-4) so as to have an even number of forty-two electrode fingers ( $2 \times 21 = 42$ ); and wherein no two of the electrode fingers extending from one of two opposed bus bars  $(21B)_1$  and  $(21B)_2$  of the second center IDT are immediately adjacent to each other. Regarding claim 3, the filter 21 in Fig. 20 includes reflectors 20A and 20B. Regarding claim 8, see col. 1, lns. 16-20.

7. Claims 9, 12, and 22 are rejected under 35 U.S.C. §§ 102(b) and 102(e) as being anticipated by Strauss et al. WO 98/12809 and U.S. 6,081,172 ['172](cited by Applicants), respectively.

The following discussion will mostly reference the U.S. document, except for explaining an obvious error in the figures.

Strauss et al. discloses a longitudinally coupled resonator type surface acoustic wave (SAW) filter having a balance-unbalance conversion function formed on a piezoelectric substrate (see '172 col. 2, lns. 43-44). Strauss et al. discloses the filter to have first and second stage filters each with three IDTs, wherein a first filter has the structure of Fig. 3 with outer IDTs connected in series and a second filter has the structure of, for example, the lower filter in Fig. 2 with its outer IDTs connected in parallel (see col. 2, lns. 62-67). Therefore, the second stage lower filter in Fig. 2 has opposed bus bars at second IDT3 which are connected to first and second balanced

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signal terminals (note the labeling of the terminals of the lower filter in Fig. 2 of the U.S. document is in error, and the correct labels can be seen in Fig. 2 of the WO document); the first stage filter of Fig. 3 has an unbalanced signal terminal connected to one end of the second IDT3 (with the other end of IDT3 connected to ground); and the first and second signal lines coming out of the first IDT2 and third IDT4 of the first stage filter of Fig. 3 will connect to the first IDT2 and third IDT4 of the second stage lower filter of Fig. 2, wherein these first and second signal lines which are symmetrical outputs of the first stage filter of Fig. 3 are 180° out of phase by the definition of symmetrical signals. Regarding claim 12, each of the filters includes reflectors REF1 and REF5. Regarding claim 22, see '172 col. 1, lns. 10-18.

*New Grounds of Claim Rejections - 35 USC § 103*

8. The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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9. Claim 11 is rejected under 35 U.S.C. § 103(a) as being unpatentable over either Strauss et al. WO 98/12809 or U.S. 6,081,172 ['172](cited by Applicants) taken alone.

Strauss et al. discloses the invention as discussed above, except for explicitly disclosing a piezoelectric substrate of  $\text{LiTaO}_3$  or  $\text{LiNbO}_3$ .

The Examiner takes Official Notice that piezoelectric substrates of  $\text{LiTaO}_3$  or  $\text{LiNbO}_3$  would have been extremely well known at the time of Applicants' invention (see other prior art of record as evidence e.g. Hartmann et al. '782 col. 8, ln. 64, and Ueda et al. '481 col. 1, lns. 35-36).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the filter of Strauss et al., if even necessary, such that the generic piezoelectric substrate would have been either  $\text{LiTaO}_3$  or  $\text{LiNbO}_3$ , because such an obvious modification would have been the mere substitution of art recognized alternative piezoelectric substrates, and because Strauss et al. is silent as to the specific material of its piezoelectric substrate, thereby suggesting to one of ordinary skill that any well known piezoelectric substrate, such as  $\text{LiTaO}_3$  or  $\text{LiNbO}_3$ , would have been usable therewith.

10. Claims 4 and 7 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Ueda et al. U.S. 5,963,114 in view of Bauer et al. WO 00/25423 or U.S. 6,420,946 (provided for its English language description).

Ueda et al. discloses the invention as discussed above, except for disclosing the second IDT of filter 21 in Fig. 20 having a wider electrode finger at each side, or each of the first second and third IDTs having a narrow pitch electrode portion.

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Bauer et al discloses (see U.S. '946) that it is known to provide a wider electrode finger at both sides of a second middle IDT in SAW longitudinally coupled resonator filters (see Fig. 1) in order to reduce loss of the surface acoustic wave because the wave propagates better under a metallized surface (see col. 2, Ins. 9-15). Bauer et al. also discloses that an even more effective means of reducing SAW propagation loss due to scattering, and thereby provide improved filter characteristics (see col. 3, Ins. 43-46 and col. 5, Ins. 54-56) is to have narrow pitch electrode finger portions at the transitions between IDTs [see Fig. 4b and col. 5, Ins. 30-42], and Bauer et al. also discloses using such a structure in balanced-unbalanced filters (see col. 6, Ins. 53-64).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Ueda et al.'s SAW filter 21 (Fig. 20) such that the center IDT would have had a wider electrode finger at each side or all three IDTs would have had a narrow pitch electrode finger portion, because such obvious modifications as taught, for example by Bauer et al. (Fig. 1 and Fig. 4b, respectively) would have provided the benefit of reduced SAW propagation loss as suggested by Bauer et al. (see e.g. col. 2, Ins. 9-15 and col. 6, Ins. 19-24).

11. Claims 13 and 16 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Strauss et al. WO 98/12809 or U.S. 6,081,172 (cited by Applicants) in view of Bauer et al WO 00/25423 or U.S. 6,420,946 (provided for its English language description).

Strauss et al. discloses the invention as discussed above, except for disclosing the second IDT3 of the first and second stage filters having a wider electrode finger at each side, or each of the first second and third IDTs having a narrow pitch electrode portion.



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Bauer et al. discloses such wider electrode fingers or narrow pitch electrode finger portions as discussed in the immediately preceding rejection.

Consequently, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the SAW filter of Strauss et al. such that the first and second stage filters would have had a second center IDT with a wider electrode finger at each side or all three IDTs would have had a narrow pitch electrode finger portion, because such obvious modifications as taught, for example by Bauer et al. (Fig. 1 and Fig. 4b, respectively) would have provided the benefit of reduced SAW propagation loss as suggested by Bauer et al. (see e.g. col. 2, lns. 9-15 and col. 6, lns. 19-24).

***Allowable Subject Matter***

12. Claims 5, 6, 10, 14, 15, and 17-20 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

13. It should be noted that due to the new primary references necessitated by Applicants' amendment received 2/18/03, some dependent claims that were previously rejected are now considered allowable, while some dependent claims that were previously considered allowable are now rejected.

***Response to Arguments***

14. Applicant's arguments with respect to independent claims 1 and 9 have been considered but are moot in view of the new ground(s) of rejection.

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*Conclusion*

15. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

16. Any inquiry concerning this communication should be directed to Barbara Summons at telephone number (703) 308-4947, FAX no. (703) 308-7724, receptionist's no. (703) 308-0956, Supervisory Examiner Bob Pascal (703) 308-4909.

A handwritten signature in black ink that reads "Barbara Summons". The signature is stylized with a large, looped "B" and a long horizontal stroke at the end.

Barbara Summons  
Primary Examiner  
Art Unit 2817

bs  
May 16, 2003